



## PREFACE: CONTROL THEORY AND PDE, PART I

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AND ALEXANDER J. ZASLAVSKI

This special issue on Control Theory and PDE is dedicated to Professor Irena Lasiecka on the occasion of her anniversary.

Irena Lasiecka is an outstanding American mathematician who has made fundamental contributions to control theory, partial differential equations, optimization theory, the calculus of variations, feedback stabilization, and to practical applications. She is a Distinguished University Professor of Mathematics and Chair of the Mathematics Department at the University of Memphis, Commonwealth Professor of Mathematics Emeritus of the University of Virginia, and also a co-editor-in-chief of two academic journals, *Applied Mathematics and Optimization* and *Evolution Equations and Control Theory*. Professor Lasiecka is a recipient of the 2019 Richard E. Bellman Control Heritage Award from the American Automatic Control Council, a recipient of the SIAM 2011 W. T. and Idalia Reid Prize, Fellow of AMS, SIAM, and IEEE, and ISI Highly Cited Researcher in Mathematics. She is an author of twelve books, over 400 publications, and has supervised over 30 doctoral students.

In part I of this special issue, we present papers authored by a selected group of well-recognized experts in the areas of control, optimization, and partial differential equations. Most of the papers collected here have been contributed by former students, collaborators, friends, and colleagues of Irena, who have been influenced by her research. Part I of the special issue contains nine papers contributed by researchers in control, optimization, and PDE from Argentina, Brazil, Canada, France, Germany, Italy, Poland and the USA. These papers cover a wide spectrum of important problems and topics of current research interest in control, optimization and PDE, including boundary control for a generalized wave equation, periodic longitudinal motions of a viscoelastic rod, higher-order water wave model, a two critical points theorem for non-differentiable functions and applications to highly discontinuous PDE's, time discretization of a quasi-variational inequality related to the humid atmosphere, transfinite interpolations for free and moving boundary problems, controllability for a population equation with interior degeneracy, topology design of thermomechanical actuators combined with heat source optimization and turnpike properties of convex hyperbolic optimal boundary control problems. Therefore we feel that this special issue will be highly important for many mathematicians and applied scientists, who are interested in recent developments in control, optimization and partial differential equations, as well as in their numerous applications.

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